

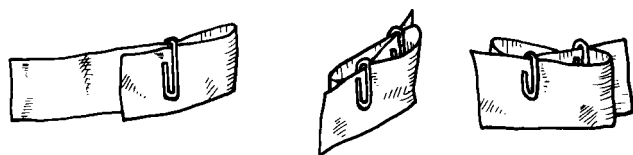
Puzzle Corner

Snip and Clip

by Dave Youngs

This month's puzzle is an adaptation of a trick I found in *Perplexing Puzzles and Tantalizing Teasers* by Martin Gardner, perhaps the greatest living proponent of recreational mathematics. This wonderful book from Dover Publications* includes many tricks, puzzles, word problems, and brain teasers appropriate for upper elementary students.

In the trick presented in this book, Gardner, who is also a magician, uses a dollar bill and two paper clips. The paper clips are attached to the bill as shown in the illustration and when the ends of the bill are pulled apart, the two paper clips slide together, become connected, and fly off the dollar — a very impressive trick indeed. In this magic trick, as in many others, mathematics is involved in some way. This particular trick is related to a rather esoteric branch of mathematics called topology.



In the spirit of economy (you might not want to hand out dollar bills to all your students!), and also to take Gardner's trick a step further and turn it into a puzzle challenge, this activity will use a long, narrow strip of paper instead of a dollar bill. Each student will need one of these strips (I used a strip about 4 – 5 cm wide cut from the long side of an 8.5 x 11 inch piece of scratch paper) and some paper clips. Have students measure and cut their own strips to give them some practice using a ruler, then have them fold the strip and attach the paper clips as shown on the student sheet. When students pull on the ends of the strip, the paper clips should become connected and pop off the strip — at least for most of them. When it works, students will be delighted with this trick and should be challenged to see if they figure out how the paper clips become joined, which they can do by making careful observations.

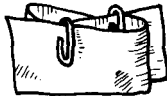
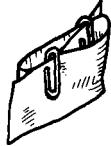
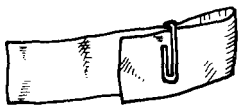
The challenge presented in *Snip and Clip*, which I discovered accidentally while playing with Gardner's original trick, is to get three or more paper clips to link together in a similar fashion. This challenge should make this a worthy puzzle, even for veteran puzzlers. In regards to this, I am reminded of Piet Hein, the inventor of the Soma Cube (see *Soma Cube Conundrums* in the October 1995 issue of *AIMS*). Hein was a man of many talents who happened to write poetry in addition to his many other avocations.

Jim Wilson, a friend and colleague here at AIMS, introduced me to Hein's unique Danish poems, which are called Grooks. In fact, I have a bulletin board in my classroom that Jim made out of one of Hein's Grooks. Jim drew a picture of a cartoon character, on a large butcher-paper, fitting the last piece of the Soma Cube puzzle into place. Below this picture is a copy of one of Hein's Grooks: "Problems worthy of attack, prove their worth by hitting back." This Grook epitomizes Jim's approach to puzzles and problems — he loves a challenge and over the years has been able to motivate his students to relish challenges as well. *Snip and Clip* is presented here in this spirit. You and your students may not be able to clip together three or more paper clips right away, but it can be done if you accept the challenge and persist. Good luck!

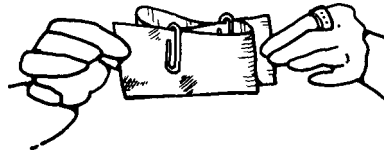
I think your students will really enjoy this puzzle. It's a great one to take home and share with friends and family members. I'll have another puzzle for you next month.

SNIP and CLIP

Cut a strip of paper about 4 – 5 centimeters wide from the long side of a piece of scratch paper. Fold the strip and attach the paper clips as shown below.



Pull on the ends of the paper. What happens? How do you explain this?



The challenge in this puzzle is to make the same thing happen to three or more paper clips.

